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EXAMINER
COLLINS, CYNTHIA E

ART UNIT	PAPER NUMBER
1638	8

DATE MAILED: 08/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/719,002	DRAPER ET AL.	
	Examin r	Art Unit	
	Cynthia Collins	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 May 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) *24* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23 and 25-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1½ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of Group I, claims 1-5 and 10-23, in Paper No. 7 is acknowledged. The traversal is on the ground(s) that the search and examination of the Groups I-III would not entail a serious burden. Upon reconsideration the restriction requirement between Groups I-III is withdrawn, and the claims of Groups I-III, claims 1-23, are examined on the merits in the instant office action. The restriction requirement for Group IV, claim 24, drawn to an agent, is maintained, as Group IV would require a separate search for an agent not claimed in Groups I-III. Additionally, claims 25-28, added in the preliminary amendment filed December 7, 2000, were inadvertently omitted from the restriction requirement, are also examined on the merits in the instant office action. Claim 24 is withdrawn from consideration as being directed to a nonelected invention.

The requirement is still deemed proper and is therefore made FINAL.

Information Disclosure Statement

An initialed and dated copy of Applicant's IDS form 1449, filed December 7, 2000, is attached to the instant Office action.

Claim Objections

Claims 4-5 are objected to because they do not comply with 37 CFR 1.821(d), which requires that reference must be made to a sequence by use of a sequence identifier, preceded by "SEQ ID NO:" in the text of the description or claims, even if the sequence is also embedded in

the text of the description or claims of the patent application.. Additionally, the numbering in claim 5 requires amendment in order to correspond to the appropriate nucleotides represented by the positive integers of the sequence identifier corresponding to the nucleotide sequence of Figure 6.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-3 and 7-23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claims are drawn to a variety of inducible pathogenesis-related gene promoters of unknown structure, including i) any promoter of any length or sequence which naturally drives the expression of a 21.3 kDa protein in *Asparagus officinalis* upon induction by plant regulators, or ii) any promoter of any length or sequence which is obtained from the *Lillaceae* or *Amaryllidaceae* families and which naturally drives the expression of proteins equivalent to the 21.3 kDa protein in *Asparagus officinalis*, or iii) any promoter of any length or sequence which naturally drives the expression of proteins substantially homologous to those of i) or ii), or iv)

any promoter of any length or sequence which hybridizes under stringent conditions to any one of i), ii) or iii).

In contrast, the specification describes only one inducible pathogenesis-related gene promoter sequence, the 475 base pair AoPRT-L promoter sequence of SEQ ID NO:1, obtained from *Asparagus officinalis* (sequence listing). The specification additionally describes a salicylic acid responsive element as comprising the region corresponding to from -257 to -133 of the AoPRT-L promoter (pages 40-41). The specification does not describe or characterize any other inducible pathogenesis-related gene promoter sequence obtained from *Asparagus officinalis* or from any other species of plant.

The Federal Circuit has recently clarified the application of the written description requirement. The court stated that a written description of an invention "requires a precise definition, such as by structure, formula [or] chemical name, of the claimed subject matter sufficient to distinguish it from other materials." University of California v. Eli Lily and Co., 119 F.3d 1559, 1568; 43 USPQ2d 1398, 1406 (Fed. Cir. 1997). The court also concluded that "naming a type of material generally known to exist, in the absence of knowledge as to what that material consists of, is not a description of that material." Id. Further, the court held that to adequately describe a claimed genus, Patent Owner must describe a representative number of the species of the claimed genus, and that one of skill in the art should be able to "visualize or recognize the identity of the members of the genus." Id.

Given the claim breadth and lack of guidance as discussed above, the specification fails to provide an adequate written description of the genus as broadly claimed. Given the lack of written description of the claimed products, any method of using them would also be

inadequately described. Accordingly, one skilled in the art would not have recognized Applicants to have been in possession of the claimed invention at the time of filing. See Written Description Requirement guidelines published in Federal Register/ Vol. 66, No.4/ Friday January 5, 2001/Notices: pp. 1099-1111).

Claims 1-3 and 7-23 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a salicylic acid and BTH inducible AoPRT-L promoter of SEQ ID NO:1 obtained from *Asparagus officinalis*, a salicylic acid and BTH inducible promoter element region corresponding to from -257 to -133 of the AoPRT-L promoter of SEQ ID NO:1, and a promoter construct comprising the AoPRT-L promoter of SEQ ID NO:1 operably linked to a synthetic sequence encoding a LhG4 transactivator and a pOP transactivator target promoter sequence, does not reasonably provide enablement for other nonexemplified promoter sequences obtained from *Asparagus officinalis* or from other sources. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

The claims are drawn to a variety of inducible pathogenesis-related gene promoters of unknown structure, including i) any promoter of any length or sequence which naturally drives the expression of a 21.3 kDa protein in *Asparagus officinalis* upon induction by plant regulators, or ii) any promoter of any length or sequence which is obtained from the *Lillaceae* or *Amaryllidaceae* families and which naturally drives the expression of proteins equivalent to the 21.3 kDa protein in *Asparagus officinalis*, or iii) any promoter of any length or sequence which naturally drives the expression of proteins substantially homologous to those of i) or ii), or iv)

any promoter of any length or sequence which hybridizes under stringent conditions to any one of i), ii) or iii).

The specification discloses the isolation from *Asparagus officinalis* of a promoter that controls the expression of a gene encoding a 21.3 kDa protein (AoPRT-L) that has homology to proteins encoded by the thaumatin-like PR5 gene family (pages 30-32). The specification also discloses the construction of an AoPRT-L promoter-GUS chimeric gene and the analysis of its expression in transgenic tobacco, *Brassica napus* and *Zea mays* plants transformed therewith, including the induction of GUS expression by salicylic acid and BTH (pages 32-40). The specification additionally discloses the identification of a salicylic acid responsive element of the AoPRT-L promoter, between -247 bp and the putative CAT and TATA boxes, and the construction of a chimeric promoter (AoPRT-Lx3) comprising the AoPRT-L promoter and two copies of the region corresponding to from -257 to -133 of the AoPRT-L promoter (pages 40-41). The specification indicates that tobacco plants transformed with the AoPRT-Lx3 chimeric promoter-GUS chimeric gene exhibit significantly greater GUS activity upon induction by salicylic acid or BTH than do plants transformed with the AoPRT-L promoter-GUS chimeric gene (page 42). The specification further discloses the construction of a construct (pGB24) comprising the AoPRT-L promoter operably linked to a synthetic sequence encoding an LhG4 transactivator, a pOP transactivator target promoter sequence, and GUS reporter gene sequence. The specification indicates that tobacco and *Brassica napus* plants transformed with pGB24 exhibit significantly greater GUS activity upon induction by salicylic acid or BTH than do plants transformed with the AoPRT-L promoter-GUS chimeric gene (pages 42-43). The specification

does not disclose the structure or function of any other inducible pathogenesis-related gene promoter obtained from *Asparagus officinalis* or from other sources.

Guidance for making and using the claimed invention is necessary for enablement because the ability of any particular nucleotide sequence to function as a promoter is highly unpredictable. Sequences homologous to a promoter sequence also cannot predictably be assumed to have promoter activity. This unpredictability originates in the mechanics of promoter function, which requires the presence of particular nucleotides in the sequence to directly mediate promoter function. As a consequence, it is unpredictable whether sequence variants of SEQ ID NO:1 would have inducible or basal promoter function, because it is unpredictable whether any sequence variant would possess all the particular nucleotides necessary to mediate inducible or basal promoter function. For example, Menke et al. teach the identity and location of particular nucleotides in the *Catharanthus roseus* Strictosidine synthase (Str) gene promoter whose presence is required for inducible or basal promoter function (The EMBO Journal, 1999, Vol. 18, No. 16, pages 4455-4463). Deletion analysis of the *C. roseus* Str gene promoter sequence indicated that nucleotides in the region from position -339 to position -145 were required to mediate jasmonate or yeast extract elicitor inducibility, and that nucleotides in the region from position -145 to position -100 were required to mediate basal promoter function (page 4456 Figure 1).

Given the claim breadth, unpredictability, and lack of guidance as discussed above, it would require undue experimentation for one skilled in the art to determine how to make or use other inducible pathogenesis-related gene promoter sequences obtained from *Asparagus officinalis* or from other sources.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-3, 5-6, 9-11 and 13, and claims dependent thereon, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is indefinite in the recitation of "plant regulators". It is unclear what "regulators" are referred to, and it is unclear in what way they regulate a plant, as a plant may be regulated in a variety of different ways by numerous different kinds of regulators, such as the regulation of photosynthesis by light, the regulation of root growth by gravity, the regulation of shoot growth by hormones, etc.

Claim 2 is indefinite in the recitation of "BTH", as an acronym may have multiple meanings.

Claim 3 is indefinite in the recitation of "thaumatin-like PR-5 protein". It is unclear in what way the protein is "like" thaumatin, as proteins may be like each other in more than one way, such as like in structure, like in function, like in expression pattern, etc. It is also unclear what "PR-5" is meant to designate, as an acronym may have multiple meanings.

Claims 5, 6 and 9 are indefinite in the recitation of "SA", as an acronym may have multiple meanings.

Claims 10 and 11 are indefinite in the recitation of "amplification system". It is unclear what type of system is being referred to, as it is unclear exactly what would be amplified by the system.

Claim 13 is indefinite in the recitation of "preferably LhG4" and "preferably pOP910". The basis for the preferences is unclear, and the acronyms "LhG4" and "pOP910" may each have multiple meanings.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 14-16 and 18-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Hennig et al. (Plant J. 1993 Sep;4(3):481-93).

The claims are drawn to a salicylic acid inducible pathogenesis-related gene promoter of unknown structure, including i) a promoter which naturally drives the expression of a 21.3 kDa protein in *Asparagus officinalis* upon induction by plant regulators, or ii) a promoter which is obtained from the *Lillaceae* or *Amaryllidaceae* families and naturally drives the expression of proteins equivalent to the 21.3 kDa protein in *Asparagus officinalis*, or iii) a promoter which naturally drives the expression of proteins substantially homologous to those of i) or ii), or iv) a promoter which hybridizes under stringent conditions to any one of i), ii) or iii), including a thaumatin-like PR-5 protein gene promoter. The claims are also drawn to an inducible pathogenesis-related gene promoter operably linked to a DNA sequence encoding a product of interest, including a protein that when expressed affects a plant trait, and further comprising a

marker gene, as well as to a vector, a host cell, including a plant cell, a transgenic plant, and a method of identifying an agent capable of regulating expression from said promoter.

Hennig et al. teach a salicylic acid inducible pathogenesis-related PR-2 gene promoter obtained from *Nicotiana tabacum* operably linked to a DNA sequence encoding a ß-glucuronidase protein of interest that when expressed affects the appearance of a plant, said promoter sequence further comprising a kanamycin-resistance marker gene as part of a vector sequence, as well as a plant host cell, a transgenic plant, and a method of identifying salicylic acid as an agent capable of regulating expression from said promoter.(page 484 Figure 2; page 485 Figure 4; page 486 Figure 5; page 488 Figure 6; paragraph spanning pages 490-491). While Hennig et al. do not explicitly teach that the Pr-2 gene promoter naturally drives the expression of a 21.3 kDa protein in *Asparagus officinalis* upon induction by plant regulators, or that the Pr-2 gene promoter is obtained from the *Lillaceae* or *Amaryllidaceae* families and naturally drives the expression of proteins equivalent to the 21.3 kDa protein in *Asparagus officinalis* or that the Pr-2 gene promoter is a thaumatin-like PR-5 protein gene promoter, the recited claim limitations impose no structural limitations on the claimed promoter. Since the claims impose no structural limitation on the claimed promoter other than that it be a "DNA molecule", the promoter taught by Hennig et al. anticipates the claimed promoter, as the promoter taught by Hennig et al. is a "DNA molecule" that meets all the functional limitations of the claims. Furthermore, parts (iii) and (iv) do not recite any particular source.

Remarks

No claim is allowed.

Claims 4-13, 17 and 25-28 are deemed free of the prior art, due to the failure of the prior art to teach or suggest a salicylic acid and BTH inducible AoPRT-L promoter of SEQ ID NO:1 obtained from *Asparagus officinalis*, or the claimed salicylic acid responsive element obtained therefrom, or promoters comprising multiple copies thereof.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Collins whose telephone number is (703) 605-1210. The examiner can normally be reached on Monday-Friday 8:45 AM -5:15 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson can be reached on (703) 306-3218. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-4242 for regular communications and (703) 308-4242 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

CC
August 10, 2003

DAVID T. FOX
PRIMARY EXAMINER
GROUP ~~180~~ 1638